REMARKS

Claims 1 through 9, 11 and 12 are currently pending in the application.

This communication is in response to the Office Action of November 19, 2003.

35 U.S.C. § 103(a) Obviousness Rejections

Obviousness Rejection Based on Hsia et al. (U.S. Patent 5,827,783) in view of Ando (U.S. Patent 6,097,053) and Haller et al. (U.S. Patent 5,804,506)

Claim 1 through 9 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Hsia et al. (U.S. Patent 5,827,783) in view of Ando (U.S. Patent 6,097,053) and Haller et al. (U.S. Patent 5,804,506). Applicants respectfully traverse this rejection, as hereinafter set forth. After carefully considering the cited prior art, the rejections, and the Examiner's comments, Applicants believe that the claimed invention is patentable over the cited prior art.

Applicants assert that to establish a *prima facie* case of obviousness under 35 U.S.C. § 103 three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Third, the cited prior art reference must teach or suggest all of the claim limitations. Furthermore, the suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Applicants' disclosure.

The Hsia reference teaches or suggests a method of forming a capacitor cell. As depicted in FIG. 6, it appears that alternating layers (layers 58, 60, 62, 64, 66, 68, 72) of silicon dioxide are formed by two different deposition processes. "[L]ayers 64, 68, and 72 are deposited by a thermal CVD method." (Hsia reference, Column 4, lines 66-67). "[L]ayers 58, 60, and 62 are deposited by a plasma CVD method." (Hsia reference, Column 5, lines 33-34). The densities of the layers formed by the thermal CVD method and the plasma CVD method produce films that vary in density by at least about 10 %. (Hsia reference, Column 6, lines 22-24). The density variation in the silicon dioxide layers produces a different etch rate in the layers formed by the thermal CVD process and the layers formed by the plasma CVD process. (Hsia reference,

Column 6, lines 9-16). Thus, the alternating layers of silicon dioxide appear to have the same composition, but different densities and etch rates due to the CVD method used to deposit them.

The Hsia reference exploits the different densities of the silicon dioxide layers. The different etch rates due to the density difference between the two types of silicon dioxide layers allows for forming the corrugated side-wall structure shown in FIG. 8. (Hsia reference, drawing FIG. 8, Column 6, lines 27-29). Achieving this corrugated structure having an enhanced side-wall area using the same composition of silicon dioxide layers is a primary object of the Hsia reference. (Hsia reference, Column 2, lines 24-57). This corrugated structure having an enhanced side-wall area is achieved by modulating the density of the silicon dioxide layers, while keeping the composition the same.

The Ando reference is relied upon in the Office Action to teach that boro-phopho silicate glass (BPSG) is a standard choice for side walls in capacitors. (Office Action of Nov. 19, 2003). The Haller reference is relied upon in the Office Action as evidence that the etch rate of BPSG may be varied by doping with germanium. (Office Action of Nov. 19, 2003). It is argued in the Office Action that the silicon layers in the Hsia reference may be replaced with BPSG in view of the Ando reference. It is additionally asserted that in view of the Haller reference, the layers of BPSG may be doped with germanium to vary the etch rate thereof.

Applicants assert that *prima facie* case of obviousness has not been established because there is no motivation or suggestion in the cited references to modify the Hsia reference in the way proposed in the Office Action. A fundamental principle of operation of the invention in the Hsia reference is that the corrugated side-wall structure is achieved by modulating the density of the silicon dioxide layers while keeping the composition constant. The modulated density produces different etch rates in the alternating silicon dioxide layers resulting in the enhanced surface area upon etching.

There is no motivation or suggestion in the Hsia reference or the other cited references to modulate the composition as in the present invention of claims 1 through 9 and 11 through 12. Furthermore, modulating the composition of the layers of the capacitor structure would destroy a fundamental principle of how the Hsia reference achieves the enhanced surface area. See, M.P.E.P. § 2143.01 (Proposed modification cannot the change the principle of operation of the

primary reference). Modifying the Hsia reference to modulate the composition in each layer, would alter the fundamental process that the corrugated structure is formed. Furthermore, the Hsia patent teaches away by maintaining the composition of each layer the same (i.e., silicon dioxide). See, M.P.E.P. § 2145(X)(D)(2)(References cannot be combined where the references teaches away from their combination). Therefore, the present invention of claims 1 through 9 may only be achieved using impermissible hindsight based solely upon the Applicants' disclosure and not from the teachings of the cited references. Accordingly, the proposed combination of the cited prior art cannot and does not establish a *prima facie* case of obviousness under 35 U.S.C. § 103 regarding the claimed invention.

Applicants assert that if the Ando reference is assumed to teach side-wall capacitor structures formed from BPSG, any combination of the cited references *might and would* result in replacing the layers of silicon dioxide in the Hsia reference with layers of BPSG having a modulated density while the composition of each layer remains constant. Clearly, such is not the claimed invention.

Accordingly, independent claims 1 through 9 are nonobvious and the rejection thereof should be withdrawn.

Obviousness Rejection Based on Hsia et al. (U.S. Patent 5,827,783), Ando (U.S. Patent . 6,097,053) and Haller et al. (U.S. Patent 5,804,506) as applied to claim 9 above, and further in view of Kawakubo (U.S. Patent 5,889,696)

Claim 11 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Hsia et al. (U.S. Patent 5,827,783), Ando (U.S. Patent 6,097,053) and Haller et al. (U.S. Patent 5,804,506) as applied to claim 9 above, and further in view of Kawakubo (U.S. Patent 5,889,696.

Dependent claim 11 is nonobvious because it depends from a novel and nonobvious base claim. Therefore, the rejection of dependent claim 11 should be withdrawn.

Obviousness Rejection Based on Hsia et al. (U.S. Patent 5,827,783), Ando (U.S. Patent 6,097,053) and Haller et al. (U.S. Patent 5,804,506) as applied to claim 9 above, and further in view of DeBoer et al. (U.S. Patent 5,930,106) and DERWENT copy, under "Novelty"

Claim 12 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Hsia et al. (U.S. Patent 5,827,783), Ando (U.S. Patent 6,097,053) and Haller et al. (U.S. Patent 5,804,506) as applied to claim 9 above, and further in view of DeBoer et al. (U.S. Patent 5,930,106) and DERWENT copy, under "Novelty".

Dependent claim 12 is nonobvious because it depends from a novel and nonobvious base claim. Therefore, the rejection of dependent claim 12 should be withdrawn.

CONCLUSION

Applicants submit that claims 1 through 9, 11 and 12 are clearly allowable over the cited prior art. Applicants request the allowance of claims 1 through 9, 11 and 12 and the case passed for issue.

Respectfully submitted,

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Date: February 17, 2004
JRD/sls:djp
Document in ProLaw